

WHAT IS CLAIMED IS:

1. A method for selectively separating at least one component from a multi-component fluidic sample, said method comprising:

5 introducing said multi-component fluidic sample into a micro-fluidic device having a fluid flow path and at least one micro-valve comprising a phase reversible material; and

10 contacting said introduced multi-component fluidic sample with said microvalve under conditions sufficient for said at least one component to at least move into said microvalve while the remaining components of said multi-component fluidic sample remain outside of said microvalve;

15 wherein said at least one component is selectively separated from said multi-component fluidic sample.

2. The method according to Claim 1, wherein said phase reversible material is a phase reversible polymer.

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3. The method according to Claim 1, wherein said phase reversible material is thermo-reversible.

4. The method according to Claim 1, wherein said method further comprises modulating the porosity of said microvalve at least once during said method.

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5. The method according to Claim 1, wherein said at least one analyte is a low molecular weight analyte.

6. A method for selectively separating components having a molecular weight below a threshold value from a multi-component fluidic sample, said method comprising:

30 introducing said multi-component fluidic sample into a micro-fluidic device having a fluid flow path and at least one micro-valve comprising a phase reversible

material having a porosity that can be modulated in response to an applied stimulus; and

5 contacting said introduced multi-component fluidic sample with said microvalve under conditions sufficient for said components of said multi-component fluidic sample having a molecular weight below said threshold value to at least move into said microvalve while the remaining components of said multi-component fluidic sample remain outside of said microvalve;

wherein said components having a molecular weight below a threshold value are selectively separated from said multi-component fluidic sample.

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7. The method according to Claim 6, wherein said phase reversible material is a phase reversible polymer.

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8. The method according to Claim 6, wherein said phase reversible material is thermo-reversible.

9. The method according to Claim 6, wherein said method further comprises modulating the porosity of said microvalve at least once during said method by applying said stimulus to said microvalve.

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10. The method according to Claim 9, wherein said stimulus is a change in temperature.

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11. The method according to Claim 6, wherein said threshold value is about 1000 daltons and said method is a method of desalting said multi-component fluidic sample.

12. A method for concentrating a multi-component fluidic sample with respect to at least one constituent thereof, said method comprising:

30 introducing said multi-component fluidic sample into a micro-fluidic device having a fluid flow path and at least one micro-valve comprising a phase reversible

material having a porosity that can be modulated in response to an applied stimulus; and

5 contacting said introduced multi-component fluidic sample with said microvalve under conditions sufficient for components of said multi-component fluidic sample having a molecular weight below a threshold value to at least move into said microvalve while the remaining components of said complex fluidic sample remain outside of said microvalve;

wherein said multi-component fluidic sample is concentrated with respect to at least one constituent thereof.

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13. The method according to Claim 12, wherein said phase reversible material is a phase reversible polymer.

14. The method according to Claim 12, wherein said phase reversible material is 15 thermo-reversible.

15. The method according to Claim 12, wherein said method further comprises modulating the porosity of said microvalve at least once during said method by applying said stimulus to said microvalve.

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16. The method according to Claim 15, wherein said stimulus is a change in temperature.

25 17. A kit for use in selectively separating at least one component from a multi-component fluidic sample, said kit comprising:

(a) a micro-fluidic device having a fluid flow path and at least one micro-valve comprising a phase reversible material; and

(b) at least one of:

(i) instructions for practicing the method of Claim 1; and

(ii) means for obtaining instructions for practicing the method of Claim 1; wherein said instructions and means for obtaining the same are recorded onto a substrate.

5 18. The kit according to Claim 17, wherein said substrate is a printable substrate.

19. The kit according to Claim 17, wherein said substrate is an electronically recordable substrate.

10 20. The kit according to Claim 17, wherein said kit further comprises a phase reversing means.